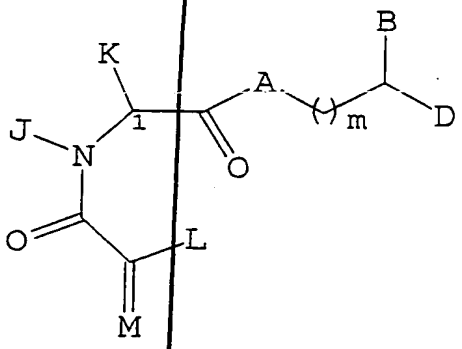
WE CLAIM:

1. A method for treating alopecia or promoting hair growth in an animal, which comprises administering to said animal an effective amount of a pipecolic acid derivative of formula I

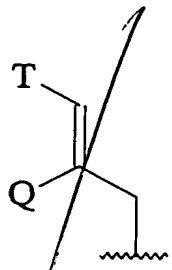


I

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

A is CH_2, O, NH, or N-(C_1-C_4 alkyl);

B and D are independently Ar, C_5-C_7 cycloalkyl substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkenyl substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, or Ar substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, wherein in each case, one or two carbon atom(s) of said alkyl or alkenyl may be substituted with one or two heteroatom(s) independently selected from the group consisting of oxygen, sulfur, SO, and SO_2 in chemically reasonable substitution patterns, or



wherein Q is hydrogen, C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl; and

T is Ar or C_5-C_7 cycloalkyl substituted at positions 3 and 4 with substituents independently selected from the group consisting of hydrogen, hydroxy, O-(C_1-C_4 alkyl), O-(C_2-C_4 alkenyl), and carbonyl;

Ar is selected from the group consisting of 1-napthyl, 2-napthyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl and phenyl, monocyclic and bicyclic heterocyclic ring systems with individual ring sizes being 5 or 6 which contain in either or both rings a total of 1-4 heteroatoms independently selected from oxygen, nitrogen and sulfur; wherein Ar contains 1-3 substituent(s) independently selected from the group consisting of hydrogen, halo, hydroxy, hydroxymethyl, nitro, CF_3, trifluoromethoxy, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), O-benzyl, O-phenyl, amino,

1,2-methylenedioxy, carbonyl, and phenyl;

L is either hydrogen or U; M is either oxygen or CH-U, provided that if L is hydrogen, then M is CH-U, or if M is oxygen then L is U;

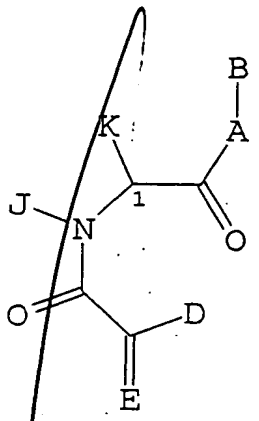
U is hydrogen, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkyl, C_5-C_7 cycloalkenyl substituted with C_1-C_4 straight or branched chain alkyl or C_2-C_4 straight or branched chain alkenyl, (C_1-C_4 alkyl or C_2-C_4 alkenyl)-Ar, or Ar;

J is hydrogen, C_1 or C_2 alkyl, or benzyl; K is C_1-C_4 straight or branched chain alkyl, benzyl or cyclohexylmethyl; or J and K are taken together to form a 5-7 membered heterocyclic ring which is substituted with oxygen, sulfur, SO, or SO_2;

n is 0-3; and

said pipecolic acid derivative has an affinity for FKBP-type immunophilins.

2. A method for treating alopecia or promoting hair growth in an animal, which comprises administering to said animal an effective amount of a pipecolic acid derivative of formula II

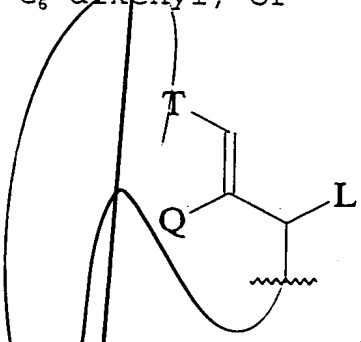


II

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

A is O, NH, or N-(C_1-C_4 alkyl);

B is hydrogen, CHL-Ar, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkyl, C_5-C_7 cycloalkenyl, Ar substituted C_1-C_6 alkyl or C_2-C_6 alkenyl, or



wherein L and Q are independently hydrogen, C_1-C_6 straight or branched chain alkyl, or C_2-C_6 straight or branched chain alkenyl; and

T is Ar or C_5-C_7 cyclohexyl substituted at positions 3 and 4 with substituents independently selected from the group consisting of hydrogen, hydroxy, O-(C_1-C_4

alkyl), O-(C_2-C_4 alkenyl), and carbonyl;

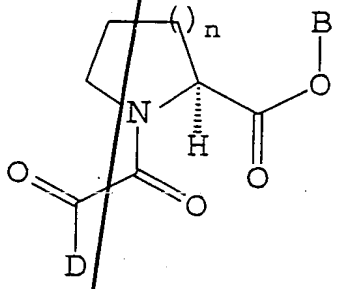
Ar is selected from the group consisting of 1-napthyl, 2-napthyl, 2-furyl, 3-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl and phenyl having 1-3 substituent(s) independently selected from the group consisting of hydrogen, halo, hydroxy, nitro, CF_3, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), O-benzyl, O-phenyl, amino, and phenyl.

D is hydrogen or U; E is oxygen or CH-U, provided that if D is hydrogen, then E is CH-U, or if E is oxygen, then D is U;

U is hydrogen, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7-cycloalkyl, C_5-C_7 cycloalkenyl substituted with C_1-C_4 straight or branched chain alkyl or C_2-C_4 straight or branched chain alkenyl, 2-indolyl, 3-indolyl, (C_1-C_4 alkyl or C_2-C_4 alkenyl)-Ar, or Ar;

J is hydrogen, C_1 or C_2 alkyl, or benzyl; K is C_1-C_4 straight or branched chain alkyl, benzyl or cyclohexylethyl; or J and K are taken together to form a 5-7 membered heterocyclic ring which is substituted with oxygen, sulfur, SO, or SO_2.

3. A method for treating alopecia or promoting hair growth in an animal, which comprises administering to said animal an effective amount of a pipecolic acid derivative of formula III



III

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

n is 2;

D is phenyl, methoxy, 2-furyl, or 3,4,5-trimethoxyphenyl; and

B is benzyl, 3-phenylpropyl, 4-(4-methoxyphenyl)butyl, 4-phenylbutyl, phenethyl, 3-cyclohexylpropyl, 4-cyclohexylbutyl, 3-cyclopentylpropyl, 4-cyclohexylbutyl, 3-phenoxybenzyl, 3-(3-indolyl)propyl, or 4-(4-methoxyphenyl)butyl;

provided that

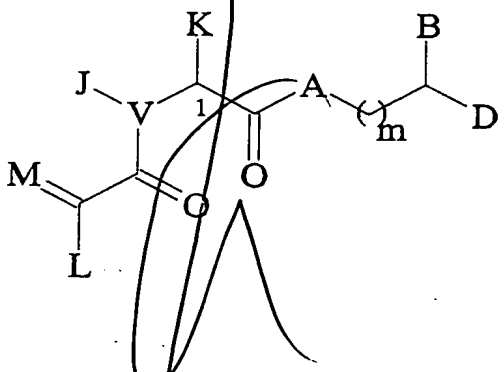
when D is phenyl, then B is benzyl, 3-phenylpropyl, 4-(4-methoxyphenyl)butyl, 4-phenylbutyl, phenethyl, or 4-cyclohexylbutyl;

when D is methoxy, then B is benzyl, 4-cyclohexylbutyl, 3-cyclohexylpropyl, or 3-cyclopentylpropyl;

when D is 2-furyl, then B is benzyl; and

when D is 3,4,5-trimethoxyphenyl, then B is 4-cyclohexylbutyl, 3-phenoxybenzyl, 4-phenylbutyl, 3-(3-indolyl)propyl, or 4-(4-methoxyphenyl)butyl.

4. A method for treating alopecia or promoting hair growth in an animal, which comprises administering to said animal an effective amount of a pipecolic acid derivative of formula IV



IV

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

V is C, N, or S;

J and K, taken together with V and the carbon atom to which they are respectively attached, form a 5-7 membered saturated or unsaturated heterocyclic ring containing, in addition to V, one or more heteroatom(s) selected from the group consisting of O, S, SO, SO_2, N, NH, and NR;

R is either C_1-C_9 straight or branched chain alkyl, C_2-C_9 straight or branched chain alkenyl, C_3-C_9

cycloakyl, C_5-C_7 cycloalkenyl, or Ar_1, wherein R is either unsubstituted of substituted with one or more substituent(s) independently selected from the group consisting of halo, haloalkyl, carbonyl, carboxy, hydroxy, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_1-C_4 alkoxy, C_2-C_4 alkenyloxy, phenoxy, benzyloxy, thioalkyl, alkylthio, sulfhydryl, amino, alkylamino, aminoalkyl, aminocarboxyl, and Ar_2;

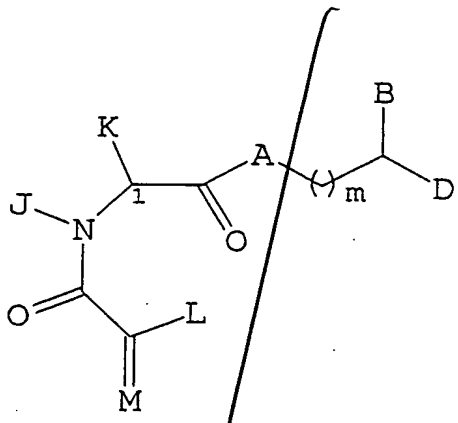
Ar_1 and Ar_2 are independently an alicyclic or aromatic, mono-, bi- or tricyclic, carbo- or heterocyclic ring; wherein the individual ring size is 5-8 members; wherein said heterocyclic ring contains 1-6 heteroatom(s) independently selected from the group consisting of O, N, and S;

A, B, D, L, M, and m are as defined in claim 1 above; and

said pipecolic acid derivative has an affinity for FKBP-type immunophilins.

5. A pharmaceutical composition which comprises:

(i) an effective amount of a pipecolic acid derivative for treating alopecia or promoting hair growth in an animal, wherein the pipecolic acid derivative is a compound of formula I

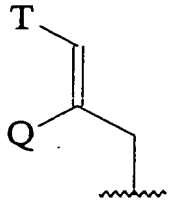


I

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

A is CH_2, O, NH, or N-(C_1-C_4 alkyl);

B and D are independently Ar, C_5-C_7 cycloalkyl substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkenyl substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, or Ar substituted C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl, wherein in each case, one or two carbon atom(s) of said alkyl or alkenyl may be substituted with one or two heteroatom(s) independently selected from the group consisting of oxygen, sulfur, SO, and SO_2 in chemically reasonable substitution patterns, or



wherein Q is hydrogen, C_1-C_6 straight or branched chain alkyl or C_2-C_6 straight or branched chain alkenyl; and

T is Ar or C_5-C_7 cycloalkyl substituted at positions 3 and 4 with substituents independently selected from the group consisting of hydrogen, hydroxy, O-(C_1-C_4 alkyl), O-(C_2-C_4 alkenyl), and carbonyl;

Ar is selected from the group consisting of 1-napthyl, 2-napthyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl and phenyl, monocyclic and bicyclic heterocyclic ring systems with individual ring sizes being 5 or 6 which contain in either or both rings a total of 1-4 heteroatoms independently selected from oxygen, nitrogen and sulfur; wherein Ar contains 1-3 substituent(s) independently selected from the group consisting of hydrogen, halo, hydroxy, hydroxymethyl, nitro, CF_3, trifluoromethoxy, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), O-benzyl, O-phenyl, amino, 1,2-methylenedioxy, carbonyl, and phenyl;

L is either hydrogen or U; M is either oxygen or CH-U, provided that if L is hydrogen, then M is CH-U, or if M is oxygen then L is U;

U is hydrogen, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl),

C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkyl, C_5-C_7 cycloalkenyl substituted with C_1-C_4 straight or branched chain alkyl or C_2-C_4 straight or branched chain alkenyl, (C_1-C_4 alkyl or C_2-C_4 alkenyl)-Ar, or Ar;

J is hydrogen, C_1 or C_2 alkyl, or benzyl; K is C_1-C_4 straight or branched chain alkyl, benzyl or cyclohexylmethyl; or J and K are taken together to form a 5-7 membered heterocyclic ring which is substituted with oxygen, sulfur, SO, or SO_2;

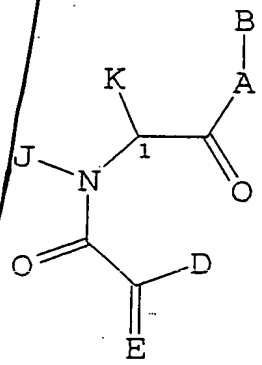
n is 0-3; and

said pipecolic acid derivative has an affinity for FKBP-type immunophilins; and

(ii) a pharmaceutically acceptable carrier.

6. A pharmaceutical composition which comprises:

(i) an effective amount of a pipecolic acid derivative for treating alopecia or promoting hair growth in an animal, wherein the pipecolic acid derivative is a compound of formula II

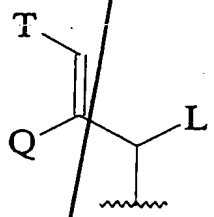


II

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

A is O, NH, or N-(C_1-C_4 alkyl);

B is hydrogen, CHL-Ar, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7 cycloalkyl, C_5-C_7 cycloalkenyl, Ar substituted C_1-C_6 alkyl or C_2-C_6 alkenyl, or



wherein L and Q are independently hydrogen, C_1-C_6 straight or branched chain alkyl, or C_2-C_6 straight or branched chain alkenyl; and

T is Ar or C_5-C_7 cyclohexyl substituted at positions 3 and 4 with substituents independently selected from the group consisting of hydrogen, hydroxy, O-(C_1-C_4 alkyl), O-(C_2-C_4 alkenyl), and carbonyl;

Ar is selected from the group consisting of 1-napthyl, 2-napthyl, 2-furyl, 3-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl 4-pyridyl and phenyl having 1-3 substituent(s) independently selected from the group consisting of hydrogen, halo, hydroxy, nitro, CF_3, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, O-(C_1-C_4 straight or branched

chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), O-benzyl, O-phenyl, amino, and phenyl.

D is hydrogen or U; E is oxygen or CH-U, provided that if D is hydrogen, then E is CH-U, or if E is oxygen, then D is U;

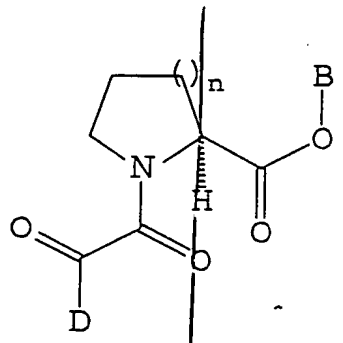
U is hydrogen, O-(C_1-C_4 straight or branched chain alkyl), O-(C_2-C_4 straight or branched chain alkenyl), C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_5-C_7-cycloalkyl, C_5-C_7 cycloalkenyl substituted with C_1-C_4 straight or branched chain alkyl or C_2-C_4 straight or branched chain alkenyl, 2-indolyl, 3-indolyl, (C_1-C_4 alkyl or C_2-C_4 alkenyl)-Ar, or Ar;

J is hydrogen, C_1 or C_2 alkyl, or benzyl; K is C_1-C_4 straight or branched chain alkyl, benzyl or cyclohexylethyl; or J and K are taken together to form a 5-7 membered heterocyclic ring which is substituted with oxygen, sulfur, SO, or SO_2; and

(ii) a pharmaceutically acceptable carrier.

7. A pharmaceutical composition which comprises:

(i) an effective amount of a pipecolic acid derivative for treating alopecia or promoting hair growth in an animal, wherein the pipecolic acid derivative is a compound of formula III



III

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

n is 2;

D is phenyl, methoxy, 2-furyl, or 3,4,5-trimethoxyphenyl; and

B is benzyl, 3-phenylpropyl, 4-(4-methoxyphenyl)butyl, 4-phenylbutyl, phenethyl, 3-cyclohexylpropyl, 4-cyclohexylbutyl, 3-cyclopentylpropyl, 4-cyclohexylbutyl, 3-phenoxybenzyl, 3-(3-indolyl)propyl, or 4-(4-methoxyphenyl)butyl;

provided that

when D is phenyl, then B is benzyl, 3-phenylpropyl, 4-(4-methoxyphenyl)butyl, 4-phenylbutyl, phenethyl, or 4-cyclohexylbutyl;

when D is methoxy, then B is benzyl, 4-cyclohexylbutyl, 3-cyclohexylpropyl, or 3-cyclopentylpropyl;

when D is 2-furyl, then B is benzyl; and

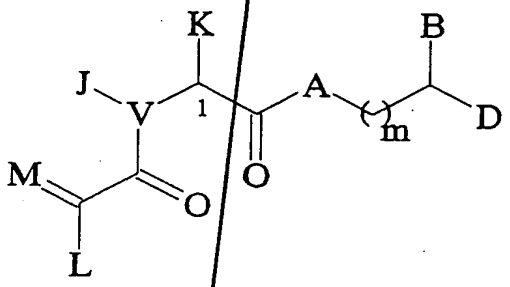
when D is 3,4,5-trimethoxyphenyl, then B is 4-cyclohexylbutyl, 3-phenoxybenzyl, 4-phenylbutyl, 3-(3-indolyl)propyl, or 4-(4-

methoxyphenyl)butyl; and

(ii) a pharmaceutically acceptable carrier.

8. A pharmaceutical composition which comprises:

(i) an effective amount of a pipecolic acid derivative for treating alopecia or promoting hair growth in an animal, wherein the pipecolic acid derivative is a compound of formula formula IV



IV

or a pharmaceutically acceptable salt, ester, or solvate thereof, wherein:

V is C, N, or S;

J and K, taken together with V and the carbon atom to which they are respectively attached, form a 5-7 membered saturated or unsaturated heterocyclic ring containing, in addition to V, one or more heteroatom(s) selected from the group consisting of O, S, SO, SO_2, N, NH, and NR;

R is either C_1-C_9 straight or branched chain alkyl, C_2-C_9 straight or branched chain alkenyl, C_3-C_9 cycloakyl, C_5-C_7 cycloalkenyl, or Ar_1, wherein R is

either unsubstituted of substituted with one or more substituent(s) independently selected from the group consisting of halo, haloalkyl, carbonyl, carboxy, hydroxy, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl, C_2-C_6 straight or branched chain alkenyl, C_1-C_4 alkoxy, C_2-C_4 alkenyloxy, phenoxy, benzyloxy, thioalkyl, alkylthio, sulfhydryl, amino, alkylamino, aminoalkyl, aminocarboxyl, and Ar_2;

Ar_1 and Ar_2 are independently an alicyclic or aromatic, mono-, bi- or tricyclic, carbo- or heterocyclic ring; wherein the individual ring size is 5-8 members; wherein said heterocyclic ring contains 1-6 heteroatom(s) independently selected from the group consisting of O, N, and S;

A, B, D, L, M, and m are as defined in claim 5 above; and

(ii) a pharmaceutically acceptable carrier.